

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):

MEHRDAD NIKOONAHAD ET AL.

Title:

SCANNING SYSTEM FOR INSPECTION ANOMALIES ON  
SURFACES

Application No.: 10/666,120

Filing Date: September 19, 2003

Examiner: Unknown

Group Art Unit: 2877

Docket No.: TNCR.001US4

Conf. No.: 8430

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

Dear Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicants call the documents listed on the enclosed Form PTO-1449 to the Examiner's attention in this patent application.

Copies of the documents listed on the accompanying Form PTO-1449 and Form PTO-892 that are not enclosed were previously submitted in Application No. 09/954,287 from which this Application claims an earlier effective filing date.

Citation of these documents shall not be construed as (1) an admission that the documents are prior art with respect to the invention or inventions claimed in this application, (2) a representation that a search has been made (other than as indicated by any cited document), or

Attorney Docket No.: TNCR.001US4

Application No.: 10/666,120

(3) an admission that the cited information is, or is considered to be, material to patentability as defined in § 1.56(b).

This information disclosure statement is submitted under 37 C.F.R. § 1.97(b) and consequently no fee should be required. The Commissioner is authorized, however, to charge any fee that may be required, or to credit any overpayment, against Deposit Account No. 502664. This form is being submitted in duplicate.

Respectfully submitted,

  
James S. Hsue  
Reg. No. 29,545

2/11/04  
Date

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Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 CFR § 1.97(b)**

Dear Sir:

Pursuant to 37 C.F.R. § 1.56, § 1.97 and § 1.98, Applicants wish to call the following documents (copies enclosed) to the attention of the Examiner for the above-identified patent application.

A form PTO-1449 listing these documents are enclosed.

Citation of the above documents shall not be construed as:

1. an admission that the documents are necessarily prior art with respect to the instant invention;

2. a representation that a search has been made, a representation that a search has been made, (other than as indicated by any cited document); or

3. an admission that the information cited herein is, or is considered to be, material to patentability as defined in § 1.56(b).

Respectfully submitted,

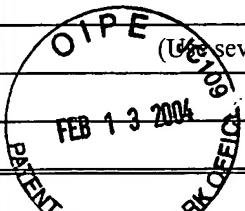


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|   |                 |  |         |       |                 |                            |    |
|---|-----------------|--|---------|-------|-----------------|----------------------------|----|
| U.S. Department of Commerce, Patent and Trademark                       |                 | Atty. Docket No.   |         |       | Application No. |                            |    |
| INFORMATION DISCLOSURE STATEMENT BY<br>APPLICANT                        |                 | TNCR.001US4  |         |       | 10/666,120      |                            |    |
|   |                 | Applicant(s)   |         |       | Conf. No.       |                            |    |
| (Use several sheets if necessary)                                       |                 | Nikoonahad et al.  |         |       | 8430            |                            |    |
|   |                 | Filing Date  |         |       | Group           |                            |    |
|   |                 | 9/19/03  |         |       | 2877            |                            |    |
| <b>U.S. Patent Documents</b>  |                 |  |         |       |                 |                            |    |
| *Examiner Initial   | Document Number | Date   | Name    | Class | Subclass        | Filing Date If Appropriate |    |
|   |                 |  |         |       |                 |                            |    |
|   |                 |  |         |       |                 |                            |    |
| <b>U.S. Published Patent Application Documents</b>                      |                 |  |         |       |                 |                            |    |
| *Examiner Initial   | Document Number | Date   | Name    | Class | Subclass        | Filing Date If Appropriate |    |
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|   |                 |  |         |       |                 |                            |    |
| <b>Foreign Patent Documents</b>   |                 |  |         |       |                 |                            |    |
|   |                 |  |         |       |                 | Translation                |    |
|   | Document        | Date   | Country | Class | Subclass        | Yes                        | No |
|   |                 |  |         |       |                 |                            |    |
| <b>OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)</b> |                 |  |         |       |                 |                            |    |
|   | 1               | Chang, "Acoustooptic Devices and Applications," <i>IEEE Transactions on Sonics and Ultrasonics</i> , Vol. SU-23, No. 1, January 1976, pp. 1-22.        |         |       |                 |                            |    |
|   | 2               | Dickson, "Optical Considerations for an Acoustooptic Deflector," <i>Applied Optics</i> , Vol. II, No. 10, Oct. 1972, pp. 2196-2202.                    |         |       |                 |                            |    |
|   | 3               | Young, Jr. et al., "Design Considerations for Acousto-Optic Devices," <i>Proceedings of IEEE</i> , Vol. 69, January 1981, pp. 54-64.                   |         |       |                 |                            |    |
|   | 4               | Uchida et al., "Acoustooptic Deflection Materials and Techniques," <i>Proceedings of the IEEE</i> , Vol. 61, No. 8, August 1973, pp. 1073-1092.        |         |       |                 |                            |    |
|   | 5               | Randolph et al., "Modulation Transfer Characteristics of an Acoustooptic Deflector," <i>Applied Optics</i> , Vol. 10, No. 6, June 1971, pp. 1383-1385. |         |       |                 |                            |    |
|   | 6               | Grossman et al., "High Speed Laser Facsimile Scanner," <i>SPIE, Laser Recording and Information Handling</i> , Vol. 200, 1979, pp. 8-15.               |         |       |                 |                            |    |
|   | 7               | Merry, "High Resolution Acoustooptic Deflector Demonstrated in a Laser Scanner," pp. 32-34.  |         |       |                 |                            |    |
|   | 8               | "All About Bragg Angle Errors in Acousto-Optic Modulators and Deflectors," <i>ISOMET</i> , May 1993, pp. 1-23.   |         |       |                 |                            |    |
|   | 9               | Bademian, "Acousto-Optical Deflectors," <i>ISOMET</i> , May 1993, pp. 1-32.  |         |       |                 |                            |    |



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Aviator-Optic Deflectors," ISOMET, pp. 1-9

Examiner

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|--|--|---------------------------|------------|
| U.S. Department of Commerce, Patent and Trademark Office   |  | Atty Docket No.           | Serial No. |
|  |  | TNCR.001US3               | 09/954,287 |
| SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT |  | Applicant(s)              |            |
| (Use several sheets if necessary)                          |  | MEHRDAD NIKOONAHAD ET AL. |            |
|  |  | Filing Date               | Group      |
|  |  | September 11, 2001        | 2877       |

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|                   | A1  | 4,794,264       | 12/27/98 | Quackenbos et al. | 250   | 563      |                            |
|                   | A2  | 5,888,710       | 03/30/99 | Adachi et al.     | 430   | 523      |                            |
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|                   | A5  | 6,292,259       | 09/18/01 | Fossey et al.     | 356   | 237.2    |                            |
|                   | A6  |                 |          |                   |       |          |                            |
|                   | A7  |                 |          |                   |       |          |                            |
|                   | A8  |                 |          |                   |       |          |                            |
|                   | A9  |                 |          |                   |       |          |                            |
|                   | A10 |                 |          |                   |       |          |                            |
|                   | A11 |                 |          |                   |       |          |                            |

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|  |    | Document  | Date     | Country | Class | Subclass | Translation |
|--|----|-----------|----------|---------|-------|----------|-------------|
|  | B1 | 63-284455 | 11/21/88 | Japan   |       |          | Yes         |
|  | B2 | H5-332946 | 12/17/93 | Japan   |       |          | Yes         |
|  | B3 |           |          |         |       |          |             |
|  | B4 |           |          |         |       |          |             |
|  | B5 |           |          |         |       |          |             |

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|  | C1 | "Discrete Sources Method For The Silicon Wafers Defect Discrimination," Yuri Eremin and N. Orlov, <i>J. 12<sup>th</sup> Annual Review of Progress in Applied Computational Electromagnetics</i> , March 18-22, 1996, pp. 758-763                                 |
|  | C2 | "Determination of COP Distribution After SC1 Cleaning By A Laser Particle Counter," T. Fujise, et al., <i>Optical Characterization Techniques For High-Performance Microelectronic Device Manufacturing III</i> , SPIE Proc. Vol. 2877, Oct. 16, 1997, pp. 16-25 |
|  | C3 |  |

|          |                 |
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.

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## Notice of References Cited

Application/Control No.  
09/954,287Applicant(s)/Patent Under  
Reexamination  
NIKOONAHAD ET AL.Examiner  
Richard A RosenbergerArt Unit  
2877  
Page 1 of 1

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| * | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name          | Classification |
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| A | US-5,125,741                                     | 06-1992         | Okada et al.  | 356/237.2      |
| B | US-6,118,525                                     | 09-2000         | Fossey et al. | 356/237.2      |
| C | US-  |                 |               |                |
| D | US-  |                 |               |                |
| E | US-  |                 |               |                |
| F | US-  |                 |               |                |
| G | US-  |                 |               |                |
| H | US-  |                 |               |                |
| I | US-  |                 |               |                |
| J | US-  |                 |               |                |
| K | US-  |                 |               |                |
| L | US-  |                 |               |                |
| M | US-  |                 |               |                |

## FOREIGN PATENT DOCUMENTS

| * | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Country | Name | Classification |
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| N |  |                 |         |      |                |
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| R |  |                 |         |      |                |
| S |  |                 |         |      |                |
| T |  |                 |         |      |                |

## NON-PATENT DOCUMENTS

Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)

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\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)

Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

| Department of Commerce, Patent and Trademark Office   |   |                 |                   | Atty Docket No.           | Serial No. |             |     |    |
|---|---|-----------------|-------------------|---------------------------|------------|-------------|-----|----|
|   |   |                 |                   | M-10575-3C US             | 09/954,287 |             |     |    |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT<br>(Use several sheets if necessary)  |   |                 |                   | Applicant(s)              |            |             |     |    |
|   |   |                 |                   | MEHRDAD NIKOONAHAD ET AL. |            |             |     |    |
|   |   |                 |                   | Filing Date               | Group      |             |     |    |
|   |   |                 |                   | September 11, 2001        | 2877       |             |     |    |
| U.S. Patent Documents   |   |                 |                   |                           |            |             |     |    |
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| A2  | 4,277,178   | 7/1981          | Cushing et al.    |                           |            |             |     |    |
| A3  | 4,306,808   | 12/1981         | Vander Neut       |                           |            |             |     |    |
| A4  | 4,376,583   | 3/1983          | Alford et al.     |                           |            |             |     |    |
| A5  | 4,378,159   | 3/1983          | Galbraith         |                           |            |             |     |    |
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| A7  | 4,405,238   | 9/1983          | Grobman et al.    |                           |            |             |     |    |
| A8  | 4,441,124   | 4/1984          | Heebner et al.    |                           |            |             |     |    |
| A9  | 4,526,468   | 7/1985          | Steigmeier et al. |                           |            |             |     |    |
| A10   | 4,556,290   | 12/1985         | Roulot            |                           |            |             |     |    |
| A11   | 4,589,773   | 5/1996          | Ido et al.        |                           |            |             |     |    |
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| B1  | 065051A2  | 12/1981         | Europe            |                           |            |             |     |    |
| B2  | 2-78936   | 3/1990          | Japan             |                           |            |             | Yes |    |
| B3  | 2-87047   | 3/1990          | Japan             |                           |            |             | Yes |    |
| B4  | 3-225939  | 10/1991         | Japan             |                           |            |             | Yes |    |
| B5  | 6-34559   | 2/1994          | Japan             |                           |            |             | Yes |    |
| OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)  |   |                 |                   |                           |            |             |     |    |
| C1  | "Dynamic performance of a scanning X-Y stage for automated electron-beam inspection," D.J. Clark et al., <i>J. Vac. Sci. Technol. B</i> , Vol. 10, No. 6, Nov/Dec 1992, pp. 2638-2642 |                 |                   |                           |            |             |     |    |
| C2  | "Inspection of Patterned Wafers: 0.35 μm Design Rules and Beyond," J.R. Dralla et al., presented at Semicon Kansai Japan, 1994, pp. 1-8   |                 |                   |                           |            |             |     |    |
| C3  | "Acoustooptic Scanners and Modulators," publication of Westinghouse Electric Corporation, Gottlieb, pp. 615-685   |                 |                   |                           |            |             |     |    |
| Examiner  |   | Date Considered |                   |                           |            |             |     |    |
| <p><b>*EXAMINER:</b> Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.</p> |   |                 |                   |                           |            |             |     |    |

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|  |  | Filing Date               | Group      |
|  |  | September 11, 2001        | 2877       |

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 INFORMATION DISCLOSURE STATEMENT BY APPLICANT  
 (Use several sheets if necessary)

## U.S. Patent Documents

| *Examiner Initial |     | Document Number | Date    | Name              | Class | Subclass | Filing Date If Appropriate |
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|                   | A13 | 4,601,576       | 7/1986  | Galbraith         |       |          |                            |
|                   | A14 | 4,614,427       | 9/1986  | Koizumi et al.    |       |          |                            |
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|                   | A18 | 4,748,333       | 5/1988  | Mitzutani et al.  |       |          |                            |
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|  | B6  | 62-153737 | 7/1987  | Japan   |       |          | Yes         |
|  | B7  | 62-274633 | 11/1987 | Japan   |       |          | Yes         |
|  | B8  | 63-73635  | 4/1988  | Japan   |       |          | Yes         |
|  | B9  | 62-128135 | 6/1987  | Japan   |       |          | Yes         |
|  | B10 | 6-174655  | 6/1994  | Japan   |       |          | Abstract    |

## OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

|    |   |
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| C4 | "A stand-alone scanning force and friction microscope," M. Hipp et al., <i>Ultramicroscopy</i> , 42-44 (1992), pp. 1498-1503  |
| C5 | "Dual Sensor Technology for High Speed Detection of 0.1 Micron Defects," Alumont et al., <i>SPIE</i> , Vol. 1926 "Integrated Circuit Metrology, Inspection and Process Control VII," 1993, pp. 1-12 |
| C6 | "New Laser Scanning Techniques for Wafer Inspection," M. Nikoonahad et al. <i>SPIE</i> , Vol. 2638, February 1995, pp. 285-301  |

|          |                 |
|----------|-----------------|
| Examiner | Date Considered |
|----------|-----------------|

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|  |   |                 |                   | MERHDAD NIKOONAHAD ET AL. |            |                            |
|  |   |                 |                   | Filing Date               | Group      |                            |
|  |   |                 |                   | September 11, 2001        | 2877       |                            |
| U.S. Patent Documents  |   |                 |                   |                           |            |                            |
| *Examiner Initial  | Document Number   | Date            | Name              | Class                     | Subclass   | Filing Date If Appropriate |
| A23  | 4,800,268   | 1/1989          | Miyoshi et al.    |                           |            |                            |
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| A38  | 5,083,035   | 1/1992          | Pecen et al.      |                           |            |                            |
| Foreign Patent Documents   |   |                 |                   |                           |            |                            |
|  | Document  | Date            | Country           | Class                     | Subclass   | Translation                |
| OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)   |   |                 |                   |                           |            | Yes      No                |
| C7   | "Scatterometers Improve Laser Mirrors," G. Valliant, TMA Technologies, Inc., <i>Photonics Spectra</i> , Vol. 25, Issue 8, August 1991, p. 100       |                 |                   |                           |            |                            |
| C8   | "Windowing effects on light scattering by sinusoidal surfaces," E. Marx et al., <i>SPIE</i> , Vol. 1995 Optical Scattering, 1993, pp. 2-14          |                 |                   |                           |            |                            |
| C9   | "A Light Scattering and Distribution Model for Scintillation Cameras," S. Rioux et al., <i>SPIE</i> , Vol. 1995 Optical Scattering, 1993, pp. 15-25 |                 |                   |                           |            |                            |
| Examiner   |   | Date Considered |                   |                           |            |                            |
| <b>*EXAMINER:</b> Initial if reference considered, whether or not citation is in conformance with MPEP-609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant. |   |                 |                   |                           |            |                            |

U.S. Department of Commerce, Patent and Trademark Office

Atty Docket No.

Serial No.

M-10575-3C US

09/954,287

Applicant(s)

MEHRDAD NIKOONAHAD ET AL.

Filing Date

Group

September 11, 2001

2877

## (Use several sheets if necessary)

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| A41               | 5,162,642       | 11/1992 | Akamatsu et al.   |       |          |                            |
| A42               | 5,166,516       | 11/1992 | Kajimura          |       |          |                            |
| A43               | 5,168,386       | 12/1992 | Galbraith         |       |          |                            |
| A44               | 5,241,366       | 8/1993  | Bevis et al.      |       |          |                            |
| A45               | 5,133,635       | 7/1992  | Malin et al.      |       |          |                            |
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Applicant(s)

MEHRDAD NIKOONAHAD ET AL.

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